

CURRICULUM ENRICHMENT FOR CALCULUS: MENTORING AND PROFESSIONAL LEARNING IN SENIOR SECONDARY MATHEMATICS

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ABSTRACT

To support the growth of science and mathematics in innovation and creative enterprises students need to be fully conversant with the power of calculus to solve problems, both existing and potential. This mathematical confidence is dependent on a deep understanding of the fundamental ideas of calculus, and our model examines best classroom practice for achieving this outcome. We interrogate the efficacy of a professional learning community comprising fourth year pre-service teachers, expert senior schooling teachers and mathematics educators.

THE ISSUE

Calculus is a key focus of several mathematics units which are prerequisites for the study of mathematics at university, yet the numbers of students choosing to study mathematics at this level has steadily been in decline.

"...the average number of mathematics subjects, that contribute to an ATAR, taken from WA year 12 students declined from 0.92 to 0.69 between 1992 and 2012" (Optimising STEM Education in WA Schools; Summary Report, p2).

THE APPROACH

In this unit we bring together research and practice in a collaborative model of teaching and learning, in an attempt to address this issue. We intend feeding back our findings into all our teaching of undergraduate mathematics pre-service teachers.

This work builds on previous work by:

- Kolb, D. (1984). *Experiential Learning: experience as the source of learning and development*. Prentice Hall: Eaglewood Cliffs. N.J.
- Ormond, C. (2011). Tailoring Mentoring for New Mathematics and Science Teachers: An Exploratory Study. *Australian Journal of Teacher Education*, 36(4) Article 4. Retrieved July, 2015, from <http://ro.ecu.edu.au/ajte/vol36/iss4/4>.
- Ormond, C. (2015). Mentoring partnerships as a targeted initiative for promoting teacher resilience and professional self-efficacy. Draft paper to be submitted to *Australian Journal of Teacher Education*

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